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10/582,231	06/09/2006	Hiroyuki Shioiri	292020US3PCT	2849

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EXAMINER	
MOMPER, ANNA M	

ART UNIT	PAPER NUMBER
3657	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/582,231	SHIOIRI ET AL.	
	Examiner	Art Unit	
	ANNA MOMPER	3657	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/9/2006,3/3/2008,11/12/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The following correspondence is a first office action on the merits. Preliminary amendment received 6/09/2006 has been entered. Claims 1-15 are currently pending and have been considered below.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1, and 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steuer (US 4,350,491) in view of Friedmann (US 5,201,687).

As per claim 1, Steuer discloses a belt type continuously variable transmission (Fig. 1) comprising:

two pulley shafts (1, 2) arranged in parallel a predetermined distance apart from each other (Fig. 1);

a movable sheave on each pulley shaft (4, 6), the movable sheaves being able to slide in an axial direction on the pulley shafts (Col. 2, Ln. 59-60, Col. 3, Ln. 1-2);

a fixed sheave (3, 5) arranged on each pulley shafts so as to face the moveable sheave on each pulley shaft (Fig. 1), the fixed sheave and the movable sheave that face each other on each pulley shaft together forming a groove there between (Fig. 1); and

a belt (7) wound around the grooves between the movable sheaves and the fixed sheaves that face one another (Col. 2, Ln. 55-59), wherein

at least one of the movable sheaves (4) and a motor (Fig. 3) serving as a driving source for the moving sheave are integrally provided, the motor capable of driving the movable sheave in forward and reverse directions.

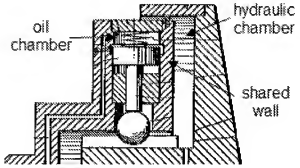
Steuer fails to explicitly disclose the motor being rotatable in a forward and reverse direction.

Friedmann discloses a continuously variable transmission with hydraulically adjustable sheaves in which a hydraulic pump (20) of a piston or vane type in order to provide a specified pressure to move movable sheave (1a) toward or away fixed sheave (1b) by either moving the piston inward or outward or rotating the piston in a forward or reverse direction in order to increase or decrease the pressure.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the transmission of Steuer to include, a vane type motor capable of rotating in a forward or reverse direction to drive the sheaves, as taught by Friedmann, for the purpose of supplying pressure used to drive the sheaves.

As per claim 7, Steuer also discloses a hydraulic pressure chamber (10) which pushes the movable sheave toward the fixed sheave using hydraulic pressure is provided in serial with the motor in the axial direction (Fig. 2, Col. 2, Ln. 59-66).

As per claim 8, Steuer also discloses at least one wall surface that forms the hydraulic pressure chamber (10) is formed by the motor (see figure below).



As per claim 9, Steuer also discloses the motor is a hydraulic motor and an oil chamber (27) in the motor and the hydraulic pressure chamber are arranged facing one another in the axial direction across the wall surface formed by the motor (See figure above).

As per claim 10, Steuer also discloses the oil chamber in the motor and the hydraulic pressure chamber are connected to each other (the oil chamber 27 and hydraulic chamber pressure chamber 10 are connected to each other via the shared wall of the hydraulic pressure chamber 10 and the motor).

As per claim 11, Steuer also discloses one of the pulley shafts (1) is a primary side pulley shaft and the other of the pulley shafts is a secondary side pulley shaft

(2), the movable sheave provided integrally with the motor is arranged on the primary side pulley shaft (Fig. 1), and a plurality of pushing mechanisms that push the

movable sheave toward the fixed sheave are provided on the movable sheave on the secondary side pulley shaft (Fig. 1, Fig. 3, the first pushing mechanism is the hydraulic chamber 10, supplied with pressure from pump 18, and the second of the plurality of pushing mechanism is the piston assembly).

4. Claims 1-6, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kapaan (US 6,689,000 B1).

As per claim 1, Kapaan et al. discloses a belt type continuously variable transmission (Pg. 1, Ln. 3-4) comprising:

a pulley shaft (3);

a movable sheave (2) on each pulley shaft (3), the movable sheaves being able to slide in an axial direction on the pulley shaft (Pg. 3, Ln. 9-10);

a fixed sheave (1) arranged on each pulley shaft (3) so as to face the moveable sheave on each pulley shaft (Fig. 1), the fixed sheave and the movable sheave that face each other on each pulley shaft together forming a groove (5) there between (Fig. 1); and

a belt wound around the grooves between the movable sheaves and the fixed sheaves that face one another (Pg. 1, Ln. 6), wherein

at least one of the movable sheaves and a motor (24) serving as a driving source for the moving sheave are integrally provided (Pg. 1, Ln. 20-29), the motor being rotatable in normal and reverse directions to drive the movable sheave.

Kapaan et al. does not explicitly disclose a second pulley shaft having a second movable and fixed sheave disposed thereon, and arranged in parallel a predetermined

distance from the first shaft, however, it would have been obvious to one of ordinary skill in the art to include the second pulley and shaft of similar arrangement to that of the first pulley and shaft since it is well known in the art to have a second pulley arranged in parallel to a first in order to receive a belt there between to transmit torque and the second pulley being a variable width pulley in order to maintain a constant tension in the belt, as evidenced by Fritzer et al. (US 6,786,844 B2, Col. 1, Ln. 19-26, Col. 14, Ln. 1-32).

As per claim 2, Kapaan et al. also discloses an integral rotating mechanism (stator housing 29, screw mechanism housing 13 and bearings 15) which rotates the motor (24) integrally with the movable sheave (2, Pg. 3, Ln. 13-22, stator housing 29, screw mechanism housing 13 and bearings 15 are connected to support shaft 3 allowing the motor to rotate with the movable sheave), and a relative moving mechanism (screw mechanism 6, first and second satellite gear wheel system 19 and 26 respectively) that moves the motor and the movable sheave relative to one another in the axial direction (Pg. 3, Ln. 19-33, first and second satellite gear wheel systems cause a rotation of the nut 14 which in turn causes a rotation of the screw 8 which causes axial movement of the movable sheave 2).

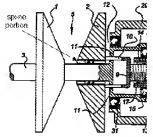
As per claim 3, Kapaan et al. also discloses a moving direction converting mechanism (screw mechanism 6) that converts force in the direction of rotation, which is driving force from the motor, into force in the axial direction is provided between the motor and the movable sheave and directly on the motor and the movable sheave (motor 23 causes rotation of the first and second satellite gear wheel systems which in

turn cause rotation of the nut 14 which causes rotation of the screw 8, which turns and drives the movable sheave in an axial direction corresponding to the rotational direction of the motor).

As per claim 4, Kapaan et al. also discloses the moving direction converting mechanism includes a moving screw portion (8).

As per claim 5, Kapaan et al. also discloses the motor (23) is provided with an inner rotor (22) which is integrated with the pulley shaft (3, through housing 13 and 29) and an outer rotor which generates driving force by rotating relative to the inner rotor (Pg. 4, Ln. 11-15); the pulley shaft is provided with a bearing (32) that rotates the outer rotor (24) relative to the pulley shaft (Pg. 4, Ln. 3-5); and a moving direction converting mechanism (screw mechanism 6) that converts force in the direction of rotation of the outer rotor to force in the axial direction is provided between the outer rotor and the movable sheave (motor 23 causes rotation of the first and second satellite gear wheel systems which in turn cause rotation of the nut 14 which causes rotation of the screw 8, which turns and drives the movable sheave in an axial direction corresponding to the rotational direction of the motor).

As per claim 6, Kapaan et al. also discloses the moving direction converting mechanism includes a spline portion provided between the outer rotor and the movable sheave (see figure below).



As per claim 15, Kapaan et al. discloses a belt type continuously variable transmission (Pg. 1, Ln. 3-4), comprising

a pulley shaft (3);

a movable sheave (2) on the pulley shaft (3), the movable sheaves being able to slide in an axial direction on the pulley shaft (Pg. 3, Ln. 9-10);

a fixed sheave (1) arranged on the pulley shaft (3) so as to face the moveable sheave on the pulley shaft (Fig. 1), the fixed sheave and the movable sheave that face each other on the pulley shaft together forming a groove (5) there between (Fig. 1); and

a belt wound around the grooves between the movable sheaves and the fixed sheaves that face one another (Pg. 1, Ln. 6), wherein

a motor (24) integrally provided with at least one of the movable sheaves (Pg. 1, Ln. 20-29) and capable of driving said movable sheave, the motor being rotatable in normal and reverse directions to drive said movable sheave.

Kapaan et al. does not explicitly disclose a second pulley shaft having a second movable and fixed sheave disposed thereon, and arranged in parallel a predetermined distance from the first shaft, however, it would have been obvious to one of ordinary skill in the art to include the second pulley and shaft of similar arrangement to that of the first pulley and shaft since it is well known in the art to have a second pulley arranged in parallel to a first in order to receive a belt there between to transmit torque and the

second pulley being a variable width pulley in order to maintain a constant tension in the belt, as evidenced by Fritzer et al. (US 6,786,844 B2, Col. 1, Ln. 19-26, Col. 14, Ln. 1-32).

5. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steuer (US 4,350,491) in view of Friedmann (US 5,201,687) and further in view of Fritzer et al. (US 6,786,844 B2).

As per claim 12, the Steuer and Friedmann combination disclose all elements of the claimed invention as described above, but fails to explicitly disclose at least one of the pushing mechanisms is a torque cam.

Fritzer et al. discloses a contact pressure regulation system (12) for a continuously variable transmission (10) in which a torque cam system (50, 52) is utilized in order to facilitate the axial movement of the movable sheave (14).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the continuously variable transmission of the Steuer and Friedmann combination to include a torque cam, as taught by Fritzer et al., for the purpose of facilitating the axial movement of the movable sheave.

As per claim 13, the Steuer and Friedmann combination discloses all elements of the claimed invention as described above, but fails to explicitly disclose an absorbing mechanism that makes the torque cam operate smoothly is provided on the fixed sheave on the secondary side pulley shaft or the movable sheave on the secondary side pulley shaft.

Fritzer et al. discloses a contact pressure regulation system (12) for a continuously variable transmission (10) in which a torque cam system (50, 52) is utilized on the output shaft, having a damping mechanism (322, 314, 312) to ensure smooth operation.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the continuously variable transmission of the Steuer and Friedmann combination to include a damping mechanism, as taught by Fritzer et al., for the purpose of facilitating the axial movement of the movable sheave.

The Steuer, Friedmann and Fritzer et al. combination fail to explicitly disclose the damping mechanism being located on the fixed pulley sheave, however it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the continuously variable transmission of the Steuer, Friedmann and Fritzer et al. combination to include the damping element being located on the fixed sheave, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

As per claim 14, the Steuer and Friedmann combination discloses all elements of the claimed invention as described above, but fails to explicitly disclose a structure which changes the degree of absorption according to the speed ratio is provided in the absorbing mechanism.

Fritzer et al. discloses a structure which changes the degree of absorption of the absorbing mechanism (314, 316) according to the speed ratio (i, Fig. 12, Fig. 13, Col. 22, Ln. 15-29).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the continuously variable transmission of the Steuer and Friedmann combination to include a structure with variable degree of absorption based on speed ratio is provided in the absorbing mechanism, as taught by Fritzer et al., for the purpose of facilitating the axial movement of the movable sheave.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANNA MOMPER whose telephone number is (571)270-5788. The examiner can normally be reached on M-F 6:00-3:30 (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Siconolfi can be reached on (571) 272-7124. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bradley T King/
Primary Examiner, Art Unit 3657

am